

Work Order ID 85312

Wednesday, June 06, 2012 10:50:43 AM

Page 1

Item ID: D412-742-013

Revision ID:

Item Name: Float Skidtube Installation

Start Date: 6/5/2012 Start Qty: 1.00

Required Date: 6/6/2012 Req'd Qty: 1.00

Reference: RMA RA111368

Approvals: Process Plan: *MF*

QC:

Date: 12-06-06 Tooling:

Date: SPC (Y/N):

N900040100

Setup Start *NS1*

Stop *NS2*

Cust Item ID:

Customer: CU-DAR001

Run Start *NR1*

Stop *NR2*

| Sequence ID/ Work Center ID | Operation Description | Set Up/ Run Hours | Tool ID | Tool # | Plan Code | Accept Qty | Reject Qty | Reject Number | Insp. Stamp |
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|
|--------------------------------|--------------------------|----------------------|---------|--------|--------------|---------------|---------------|------------------|----------------|

| Draw Nbr | Revision Nbr |
|----------|--------------|
|----------|--------------|

| | |
|--------------|---|
| IIN D412-742 | E |
|--------------|---|

100

0.00

100

QC

Quality Control

Memo

0.00

INSPECT RA 111368 D412-742-013 B 83616

BUFF OUT MARKS FROM SHIPPING DAMAGE

ENG APPROVAL NEEDED BEFORE CONTUNING

TOUCH UPS NEEDED ON FWD CAP

110

0.00

110

Skidtubes

Skidtubes

Memo

0.00

BUFF MARKS ON D3391-023 AND WAIT ON ENGINEERING APPROVAL
ON WHETHER PART IS SAVABLE

| | | | |
|---|-----------------------|---|-----------|
| DART Dart Aerospace Ltd. 1270 ABERDEEN ST. HAWKESBURY, ONT CANADA K6A 1K7 | | TC APPROVAL 4-09-89 TEL 1-813-682-5200 | |
| P/N | D412-742-013 | QFC | CHG007 |
| DESC. | Float Skidtube | STC | SR01583SE |
| LOT | B83615 | STC | SH05-37 |
| MODEL | 205/210/212/412/AB412 | STC | |
| PATENTS US 5735484, CA 2222184 EUROPEAN No. 1 0826655 | | MADE IN CANADA | |

Acceptable 6/12/12

1 x 4 JLL 11/06/12

PTG-3

Dart Aerospace Ltd

| W/O: | | WORK ORDER CHANGES | | | | | | |
|----------|------|--|----|----------|----------------------|-------------------------------------|--------------------------|--|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector | |
| 12/06/21 | 110 | Assemble with: AN3C-4A / M121205 (bolts) (1) D2646 / B88443 end-cap NAS1149C0332R / M122063 (washers) D3591-1 / B83237 D3672-1 / B80369 (Phenolic washers) (X1) | JH | 12/06/26 | X4 X4 X1 X1 | | | |
| 12/06/21 | 110 | Strip & Reallocate Fwd extrusion / QC3 PART FINISH 2) POWDER COAT: START: 10:40 120222 Temp: 320° FW: 11:10. | JH | 12/06/26 | X1 | | | |
| | | 1X | BL | 12/06/25 | | 12/06/25 | 12/06/25 | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
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NOTE: Date & initial all entries

Work Order ID 85312

85312

Page 2

Wednesday, June 06, 2012 10:50:43 AM

Item ID: D412-742-013

Accept

N900040100

Setup Start ***NS1***

Revision ID:

Item Name: Float Skidtube Installation

Stop ***NS2***

Start Date: 6/5/2012 Start Qty: 1.00

1

Cust Item ID:

Required Date: 6/6/2012 Req'd Qty: 1.00

1

Customer: CU-DAR001

Reference: RMA RA111368

Approvals: Process Plan:

Date:

Tooling:

Date:

Run Start ***NR1***

QC:

Date:

SPC (Y/N):

Date:

Stop ***NR2***

Sequence ID/
Work Center ID

Operation
Description

Set Up/
Run Hours

Tool ID

Tool #

Plan
Code

Accept
Qty

Reject
Qty

Reject
Number

Insp.
Stamp

120

0.00

120

QC

Memo

0.00

Quality Control

ENGINEERING APPROVAL

See Attached E-mail
6/12/06/08

130

0.00

130

HandFinish

Memo

0.00

Hand Finishing

TOUCH UP AND RE-ASSEMBLE PER DRAWING

INSTALL NEW HARWARE AND DISCARD OLD HARDWARE

ENG TO DETERMINE WHETHER TO REPLACE MID TUBE

Acceptable CP 12/6/21

1x of M 12/06/21

140

QC5- Inspect part completeness to step on W/O

0.00

140

QC

Memo

0.00

Quality Control

12/06/21

| W/O: | | WORK ORDER CHANGES | | | | | |
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Work Order ID 85312

Wednesday, June 06, 2012 10:50:43 AM

85312

Page 3

Item ID: D412-742-013

Accept

N900040100Setup Start ***NS1***

Revision ID:

Stop ***NS2***

Item Name: Float Skidtube Installation

Start Date: 6/5/2012 Start Qty: 1.00 ***1***

Cust Item ID:

Required Date: 6/6/2012 Req'd Qty: 1.00 ***1***

Customer: CU-DAR001

Reference: RMA RA111368

Approvals: Process Plan: Date:

Tooling: Date:

Run Start ***NR1***

QC: Date:

SPC (Y/N): Date:

Stop ***NR2***Sequence ID/
Work Center IDOperation
DescriptionSet Up/
Run Hours

Tool ID

Tool #

Plan
CodeAccept
QtyReject
QtyReject
NumberInsp.
Stamp

150

Identify as per dwg & Stock Location: _____

0.00

150

Packaging

Memo

0.00

Packaging

ID AND STOCK UNDER NEW BATCH NUMBER

160

QC21- Final Inspection - Work Order Release

0.00

160

QC

Memo

0.00

Quality Control

Skidtube's now a

LAP 912-742-043

OK 12/7/11

MF 12-07-09

Kit was
already used
in another
order

Dart Aerospace Ltd

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|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
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NOTE: Date & initial all entries

Picklist Print

Wednesday, June 06, 2012 10:50:43 AM

Page 1

Work Order ID: 85312
 Parent Item: D412-742-013
 Parent Item Name: Float Skidtube Installation

Start Date: 6/5/2012
 Start Qty: 1.00

Required Date: 6/6/2012
 Required Qty: 1.00

Comments: IPP Rev: A05.10.13New Issue KJ/JLM
 IPP Rev:B 06-06-08 As per DSI9336 JLM IPP RevC 07-12-03 ECN
 1072 DD verified by:JLM
 IPP Rev:D 08-09-08 ecn 08-510 DD verified by:EC
 IPP Rev:E 09-01-23 as per DSI9441 DD verified by:EC IPP RevF: add AN4C7A DD
 10.01.13 verified by:EC IPP Rev:G 11.11.01 as per DSI9517 REV.B DD verified
 by:EC IPP rev:H 12.01.12 PER IIN REV.E DD VERF: IPP Rev:I add AN4C47A
 DD 12.03.14 verified by:EC

| Component Item ID/ Item Name | Replacement Item ID | Mfg/ Purch | Bin Item | Primary Location | Last Location | Route Seq ID | Unit of Measure | Qty on Hand | Qty per Kit | Total Qty | Qty Issued | Date Issued | Status |
|---------------------------------|------------------------|---------------|-------------|---------------------|------------------|-----------------|--------------------|----------------|-------------|--------------|---------------|----------------|--------|
| AN3C4A BOLT | | Purchased | No | | | | Each | 1,262.0000 | | 24 | N/A | | |

| Location | Loc Qty | Loc Code |
|----------|---------|----------|
| ST350 | 1262 | |
| 120187 | 57 | |
| 120521 | 28 | |
| 120769 | 38 | |
| 121205 | 900 | |
| 121556 | 239 | |

| | | | | | | | | | | | | |
|----------------|-----------|----|--|--|--|------|----------|--|----|-----|--|--|
| AN3C6A BOLT | Purchased | No | | | | Each | 451.0000 | | 10 | N/A | | |
|----------------|-----------|----|--|--|--|------|----------|--|----|-----|--|--|

| Location | Loc Qty | Loc Code |
|----------|---------|----------|
| FP001 | 1 | |
| 111982 | 1 | |
| ST351 | 450 | |
| 111982 | 2 | |
| 116419 | 23 | |
| 116549 | 2 | |
| 116704 | 12 | |
| 117619 | 10 | |
| 117688 | 1 | |
| 117872 | 5 | |
| 118422 | 13 | |
| 119449 | 21 | |
| 120423 | 3 | |
| 120693 | 158 | |
| 121682 | 200 | |

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| W/O: | | WORK ORDER CHANGES | | | | | |
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| | | | | | | | |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries

Picklist Print

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Page 2

Work Order ID: 85312

Parent Item: D412-742-013

Parent Item Name: Float Skidtube Installation

Start Date: 6/5/2012

Required Date: 6/6/2012

Start Qty: 1.00

Required Qty: 1.00

AN3C7A Purchased No Each 140.0000

BOLT

10/10

Location

Loc Qty

Loc Code

ST351

140

113149

14

116169

1

117313

10

117619

12

117688

6

119749

1

120731

8

121185

50

121541

38

AN960C10L

NAS1149C0332R

Purchased

No

Each

0.0000

38 10/10

X PTO

washer

D412-742-013

Manufactured

No

Each

0.0000

Float Skidtube Installation

1383615¹ (x1) 11/12/25

Wednesday, June 06, 2012 10:50:43 AM

Shop Packet Print

Page 2

Dart Aerospace Ltd

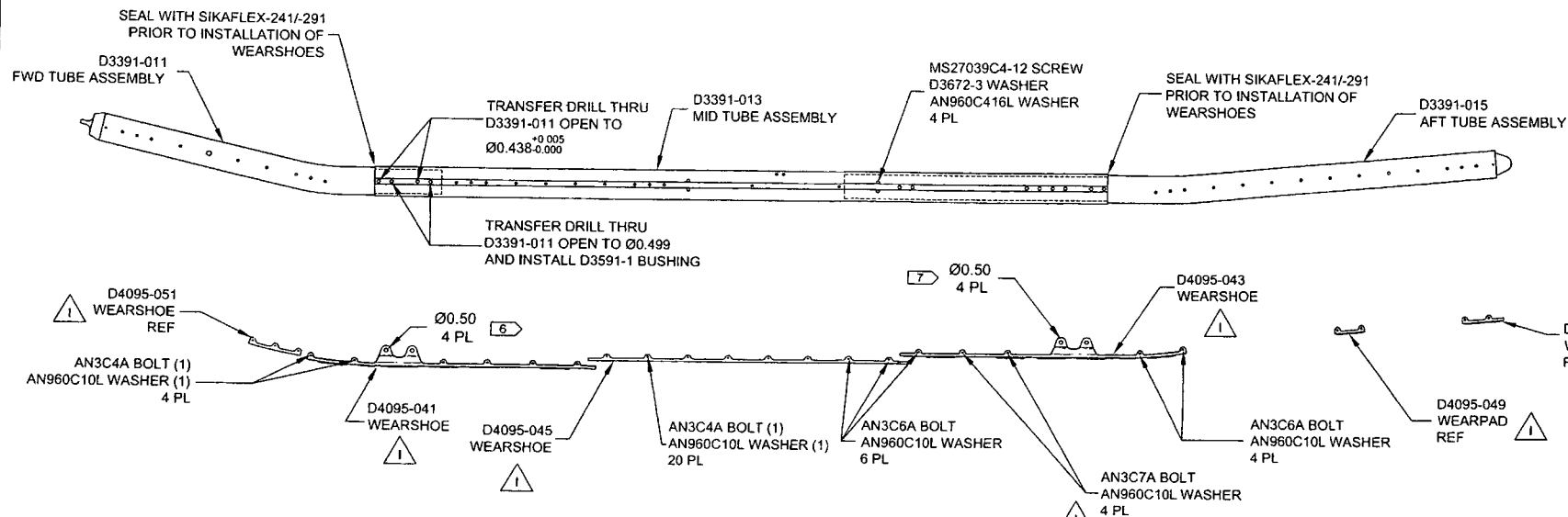
| W/O: | | WORK ORDER CHANGES | | | | | |
|----------|------|---|----|----------|-----------|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
| 12/06/25 | 110 | Assemble with: NAS1330C3K13-116 / M10337 inserts AHS4-1032-225 / M121269 (inserts) | ju | 12/06/25 | X4 X10 | | |
| | | | | | | | |

Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

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NOTE: Date & initial all entries



D3391-041 FLOAT SKIDTUBE ASSEMBLY PARTS LIST

| QTY -041 | PART NUMBER | DESCRIPTION |
|-------------|--------------|-------------------------|
| X | D3391-041 | FLOAT SKIDTUBE ASSEMBLY |
| 1 | D3391-011 | FWD TUBE ASSEMBLY |
| 1 | D3391-013 | MID TUBE ASSEMBLY |
| 1 | D3391-015 | AFT TUBE ASSEMBLY |
| 2 | D3591-1 | BUSHING |
| 4 | D3672-3 | WASHER |
| 1 | D4095-041 | WEARSHOE |
| 1 | D4095-043 | WEARSHOE |
| 1 | D4095-045 | WEARSHOE |
| 1 | D4095-047 | WEARPAD |
| 1 | D4095-049 | WEARPAD |
| 1 | D4095-051 | WEARSHOE |
| 24 | AN3C4A | BOLT |
| 10 | AN3C6A | BOLT |
| 4 | AN3C7A | BOLT |
| 38 | AN960C10L | WASHER |
| 4 | MS27039C4-12 | SCREW |
| 4 | AN960C416L | WASHER |

GENERAL NOTES

- 1) FINISH: CHEMICAL CONVERSION COAT PER DART QSI 005 4.1
POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3
- 2) COAT ALL EXPOSED FASTENERS WITH LPS LABORATORIES "LPS PROCYON"
AFTER FINAL ASSEMBLY, CLEAN EXCESS OFF POWDER COATING WITH MEK DEGREASER.
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) USE DART DRILL TEMPLATE DT8217 TO LOCATE AND DRILL Ø0.297 SIZE HOLES
FOR WEARSHOE INSERTS. C'BORE AS NOTED AND INSTALL INSERTS EXCEPT
WHERE INDICATED.
- 6) FIT D4095-041 TO SKIDTUBE WITH D2571 AND D2572 SADDLES INSTALLED WITH
APPROPRIATE HARDWARE AND SPACERS IN FORWARD AND AFT HOLES AND
TRANSFER DRILL Ø0.50 HOLES FROM SADDLE TO D4095-041
- 7) FIT D4095-043 TO SKIDTUBE WITH D2571 AND D2572 SADDLES INSTALLED WITH
THE APPROPRIATE HARDWARE AND SPACERS IN FORWARD AND AFT HOLES AND
TRANSFER DRILL Ø0.50 HOLES FROM SADDLE TO D4095-043

RELEASED
2011-11-04
EAW#11-662

| | | | |
|------------|---|--|--------------|
| I | REMOVE GASKETS AND REPLACE ALL WEARSHOES; PARTS LIST UPDATE, ZN A8-1, ZN A8-2, ZN A6-4, ZN B6-8; LPS-3 COATING REMOVED FROM NOTE 2, ZN A3-1, ZN A3-2, REMOVED INSERT AELS-1032-130, ZN B6-4, B2-4, C7-8, C3-8; REMOVED HOLES, ZN D6-4 ZN D2-4, ZN D7-8, ZN D3-8 | XDF | 11.10.13 |
| H | DRAWING UPDATED TO CURRENT STANDARDS. SHT 1 PL ADDED D3591-1 BUSHING, ZN C6 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. SHT 2 PL ADDED D3591-1 BUSHING, ZN C6 Ø0.438 DIM WAS 4 PL. ADDED Ø0.499 DIM AND D3591-1 BUSHING. (FOR FURTHER INFO SEE DSI 9364 & NCR 08-074) | AJS | 08.08.20 |
| G | REPLACE NAS INSERTS W/ AELS INSERTS SWITCH TO D3670-XXXX SPACERS FOR INSTALLING FLOAT BAGS, DWG REORGANIZED FOR CLARITY | DC | 07.07.31 |
| F | ADD SS WEARSHOE, GASKET REMOVE FWD SADDLE HOLE -011/-021 | PH | 07.01.18 |
| E | CHANGE TOLERANCE, EASE MANUFACTURE | PH | 06.04.25 |
| D | UPDATE TOLERANCE, CHANGE HOLE SIZE | PH | 06.01.23 |
| C | LENGTHEN AFT EXTENSION | PH | 05.09.27 |
| B | DRAWING UPDATES | PH | 05.06.10 |
| A | NEW ISSUE | PH | 05.02.07 |
| REV. | DESCRIPTION | BY | DATE |
| DESIGN | PH | DART AEROSPACE USA, INC | |
| DRAWN | XDF | KENT, WA | |
| CHECKED | | DRAWING NO. | REV. I |
| MFG. APPR. | | D3391 | SHEET 1 OF 8 |
| APPROVED | | TITLE | SCALE |
| DE APPR. | | 412 FLOAT SKIDTUBE | NTS |
| DATE | 11.10.13 | COPYRIGHT © 2005 BY DART AEROSPACE USA, INC THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COMBINED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC. | |

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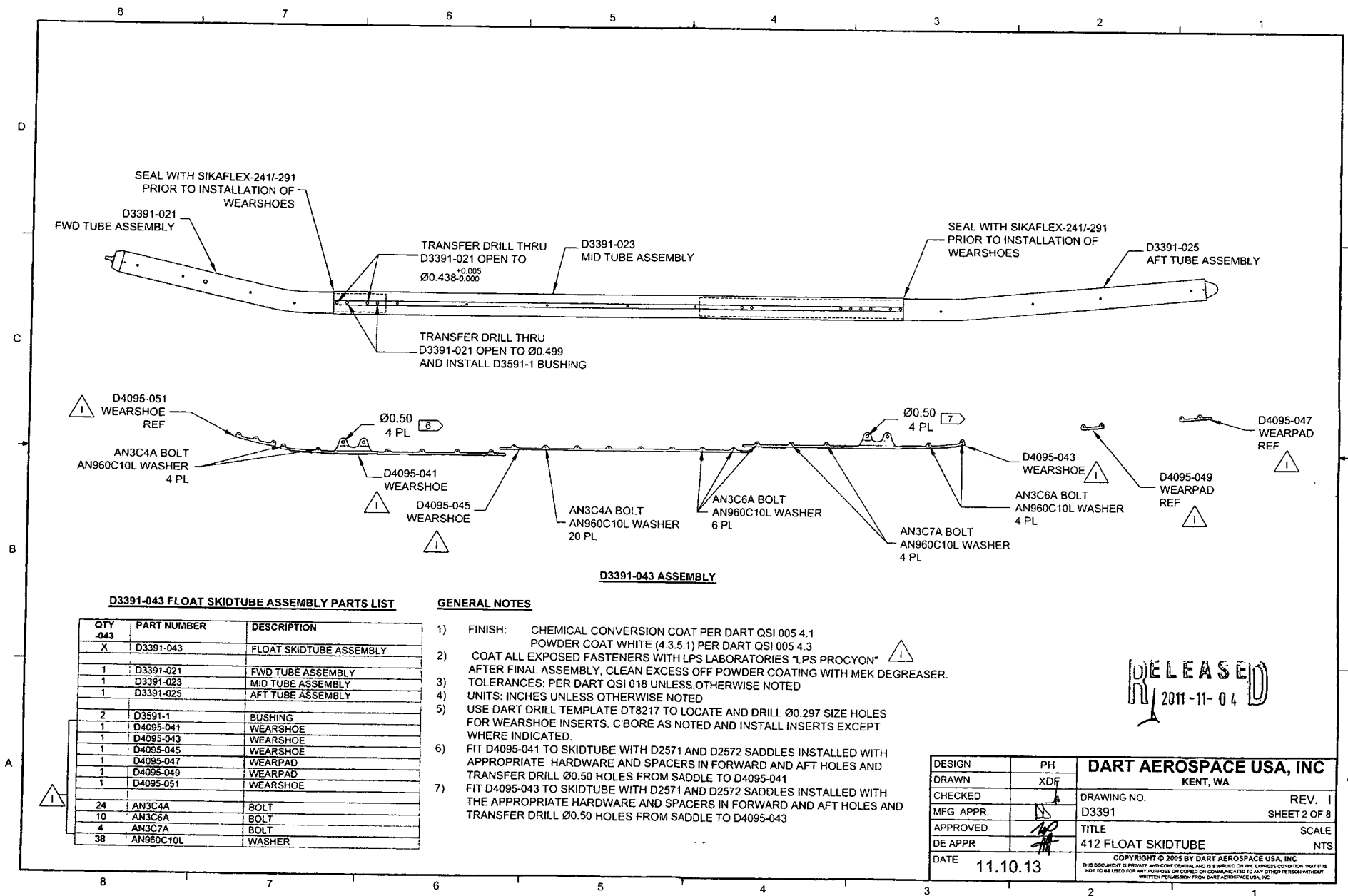
| W/O: | | WORK ORDER CHANGES | | | | | |
|------|------|--------------------|----|------|-----|-------------------------------------|--------------------------|
| DATE | STEP | PROCEDURE CHANGE | By | Date | Qty | Approval Chief Eng / Prod Mgr | Approval QC Inspector |
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NOTE: Date & initial all entries



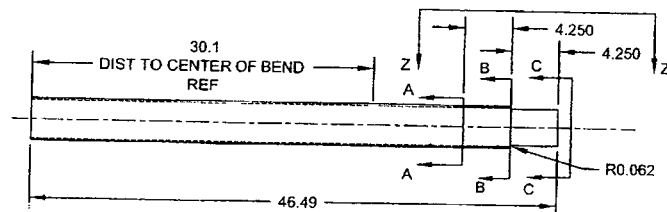
Dart Aerospace Ltd

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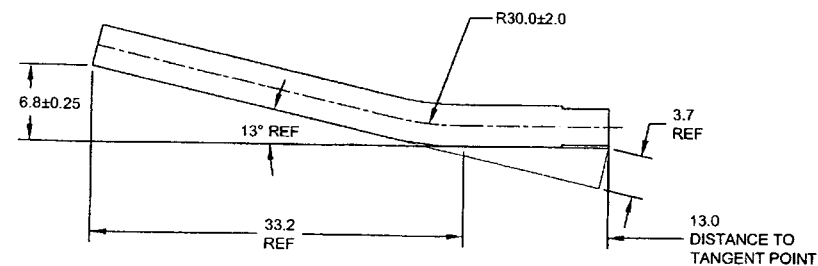
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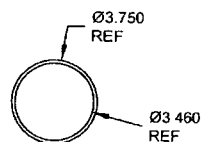
NOTE: Date & initial all entries



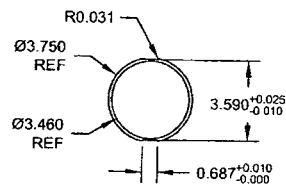
D3391-1 CUTTING DETAIL
(MAKE FROM D6013-047 SKIDTUBE MATERIAL)



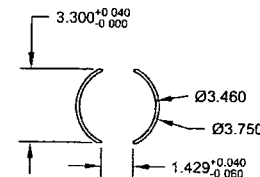
D3391-011/-021 BENDING DETAIL
(MAKE FROM D3391-1)



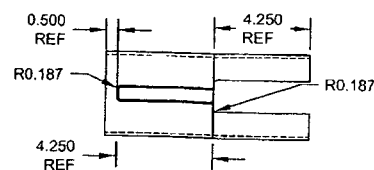
SECTION A-A
SCALE 2X



SECTION B-B
SCALE 2X



SECTION C-C
SCALE 2X



VIEW Z-Z
SCALE 2X

RELEASED
2011-11-04

| | | | |
|---|---------------|---|--------------|
| DESIGN | PH | DART AEROSPACE USA, INC | |
| DRAWN | XDF | KENT, WA | |
| CHECKED | PH | DRAWING NO. | REV. 1 |
| MFG. APPR. | PH | D3391 | SHEET 3 OF 8 |
| APPROVED | PH | TITLE | SCALE |
| DE APPR. | PH | 412 FLOAT SKIDTUBE | NTS |
| DATE | 11.10.13 | COPYRIGHT © 2005 BY DART AEROSPACE USA, INC | |
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NOTE: Date & initial all entries

RA 111368

Received @ Dart June 5th, 2012
Inspected@ Dart June 5th, 2012

Customer: Bristow US LLC
Customer Contact: Lynn Castille
Shipped from: New Iberia LA USA

Instructions for RA111368 D412-742-013 B83616 CHG007

- Touch ups needed on D3391-025
- Buff out marks from shipping damage and measure
 - Have eng signoff for dims
- Touch ups needed on fwd cap
- All work need must be done on new work order
- Needs new labels and paper work
- Needs new batch #

Time Estimate = 3 HOURS

Departments Required: Finishing (2h reworking) & Stores (1h-restocking)

Pictures Attached = YES

**THIS INSTRUCTION SHEET MUST
BE ATTACHED TO THE
RESTOCKING WORK ORDER AT
ALL TIMES!!!!**

Dart Aerospace Ltd

| W/O: | | WORK ORDER CHANGES | | | | | |
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Part No: _____ PAR #: _____ Fault Category: _____ NCR: Yes No DQA: _____ Date: _____

Resolution: _____ Disposition: _____ QA: N/C Closed: _____ Date: _____

| NCR: | | WORK ORDER NON-CONFORMANCE (NCR) | | | | | | |
|------|------|----------------------------------|-----------------------------|---------------------------------|----------------|---------------------------|-----------------------|--------------------------|
| DATE | STEP | Description of NC Section A | Corrective Action Section B | | | Verification Section C | Approval Chief Eng | Approval QC Inspector |
| | | | Initial Chief Eng | Action Description Chief Eng | Sign & Date | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

NOTE: Date & initial all entries

Linda Lacelle

From: David Shepherd <dshepherd@dartaero.com>
Sent: June-07-12 5:23 PM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Linda Lacelle'
Subject: RE: NCR D3391 mid tube

Chris,

Agree that is acceptable to repair this damage and salvage the tube.

David

From: Chris Provencal [<mailto:cprovencal@dartaero.com>]
Sent: June-06-12 12:50 PM
To: David Shepherd
Cc: Mike Petsche
Subject: NCR D3391 mid tube

David,

Two tri-beams were damaged during shipment to the customer. I've been asked to do what I can to see if they can be salvaged. Attached are two pictures of one of the tubes (the second tube will follow in another email).

The tube was gouged, on the top of the ridge, and just above the ridge. It's located 38.8" from the fwd edge of the mid-tube, ie. approximately in the middle of the tube. They've buffed out the affected region, leaving an approx. 0.5" x 0.5" area with a wall thickness of 0.087". The D2500 gives the wall thickness at 0.100+/-0.010. The surrounding area is 0.099" wall.

If this was a production tube and the damage was from excessive grinding, I would be inclined to accept the tube because the wall thickness is close to being in tolerance, located near the neutral axis, and located on the top of the tube where it's not likely to be hitting rocks and such. But because the damage is from a hard impact with an object, I am inclined to get your approval.

We can also build the area back up with welding. It's in a region where the ICA allows weld repairs.

-Chris

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Thursday, June 07, 2012 5:23 PM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Linda Lacelle'
Subject: RE: NCR D3391 mid tube

Chris,

Agree that is acceptable to repair this damage and salvage the tube.

David

From: Chris Provencal [<mailto:cprovencal@dartaero.com>]
Sent: June-06-12 12:50 PM
To: David Shepherd
Cc: Mike Petsche
Subject: NCR D3391 mid tube

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We can also build the area back up with welding. It's in a region where the ICA allows weld repairs.

-Chris

Chris Provencal

From: David Shepherd <dshepherd@dartaero.com>
Sent: Thursday, June 07, 2012 5:27 PM
To: 'Chris Provencal'
Cc: 'Mike Petsche'; 'Linda Lacelle'
Subject: RE: NCR D3391 FWD TUBE

Chris,

Agree that it is acceptable to repair this damage and salvage this tube as well. If there was a way to do a hardness check on the heat affected area, then I would recommend doing that just to see what we're dealing with.

David

From: Chris Provencal [<mailto:cprovencal@dartaero.com>]
Sent: June-06-12 1:43 PM
To: David Shepherd
Cc: Mike Petsche
Subject: NCR D3391 FWD TUBE

David,

The second of the tubes was obviously dragged on the ground/road/something. One of the fwd cap bolts was ground flush with the skid tube, which was partially ground itself. When they cut the bolt out, the inner part of the bolt was black, with some blackening of the paint on the skid and fwd cap. So there was a great deal of heat being generated.

The only other damage on this tube is a small dent in the aft cap (other end of the tube), which can be replaced.

They've cleaned up the damaged area, grinding it smooth/round (clean1.jpg/clean2.jpg). The hole is not elongated. The thickness at the hole is 0.142" (dwg = 0.145) and transitions to 0.115" thick at the fwd edge of the tube.

The only real issue is the towing load from the fwd cap. So I wouldn't consider this tube to have a potential safety issue. If the first hole is considered to be heat affected, the strength in the remaining 3 holes is: yield bearing = 97ksi x 0.188 x 0.145 x 3 = 2644 x 3 = 7,932 lb for the single tube.

I would be inclined to accept the tube, but again as the damage isn't from a manufacturing deviation, I want to get your approval.

-Chris

